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CONTRACTOR: WARTSILA MARINE INC.

FINAL REPORT

VACUUM WELD TIGHTNESS INSPECTION METHOD FOR THE MARINE INDUSTRY

ENERGY, MINES AND RESOURCES
CANMET - MTL DIVISION
SUPPLY AND SERVICES CANADA
SCIENCE BRANCH

by

WARTSILA MARINE INC.

VANCOUVER, B.C.
CANADA

AUGUST 1989

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VACUUM WELD TIGHTNESS INSPECTION METHOD FOR THE MARINE INDUSTRY

FINAL REPORT

SUBMITTTED TO:

Energy, Mines and Resources
Canmet - MTL Division

Supply and Services Canada
Science Branch

BY

WARTSILA MARINE INC.

VANCOUVER, B.C.

In association with:

Gulf Canada Resources (Gulf)
Arctic Transportation (ATL)
Lloyd's Register of Shipping (LR)
American Bureau of Shipping (ABS)
Det Norske Veritas (DNV)
Versatile Pacific Shipyards (VPSI)
Vancouver Shipyard (VS)
West Coast Manly Shipyard (WCM)
Allied Shipbuilders (AS)

AUGUST 1989

20.304

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1. INTRODUCTION

A new vacuum weld tightness inspection method for the marine industry has been developed in response to the intent and scope of the research on materials for resource industries, cost-share program issued by the Supply and Services Canada.

The objective of this project was to develop a statutory acceptable weld tightness inspection method using differential pressure as during air, hydrostatic and water tests, but instead of increasing the tank pressure a localised lowering of pressure in the vacuum chamber is induced to achieve the same result.

2. BACKGROUND INFORMATION

Currently weld tightness inspection in the marine industry is carried out using following three established methods:

- air test;
- hydrostatic test; and
- hose test.

Classification Societies such as Lloyd's Register, American Bureau of Shipping, Det Norske Veritas, as well as the Canadian Coast Guard, Ship Safety Branch accepting these test methods.

The relevant sections of the rules weld tightness inspection methods for different Classification Societies are presented in Table 1.

CLASSIFICATION SOCIETY	WATER HEAD REQUIREMENTS (M)	EQUIVALENT IN Hg (in)	AIR PRESSURE REQUIREMENTS (PSI)	EQUIVALENT IN Hg (in)
Det Norske Veritas	2.5	7.2	2.9	6.0
Lloyds	2.45	7.1	2.03	4.1
ABS	2.44	7.1	2.03	4.1
CSI	2.44	7.1		

TABLE 1

These established inspection methods are discussed below:

Air Test Method

This is the preferred test method which is used when ship is in drydock or afloat without the need to compensate for the additional weight or an asymmetrical loading required in hydrostatic test. Labour is required to blank off all tank openings such as suction pipes, filling pipes, vent pipes, sounding pipes and access prior to carrying out the test. The tank is

then filled to a pressure usually equivalent to the height of the vent pipe above the deck. A soap solution is then applied to the weld seams and any escaping air bubbles are indicative of leaking welds. The blanks are removed on completion of the weld tightness inspection.

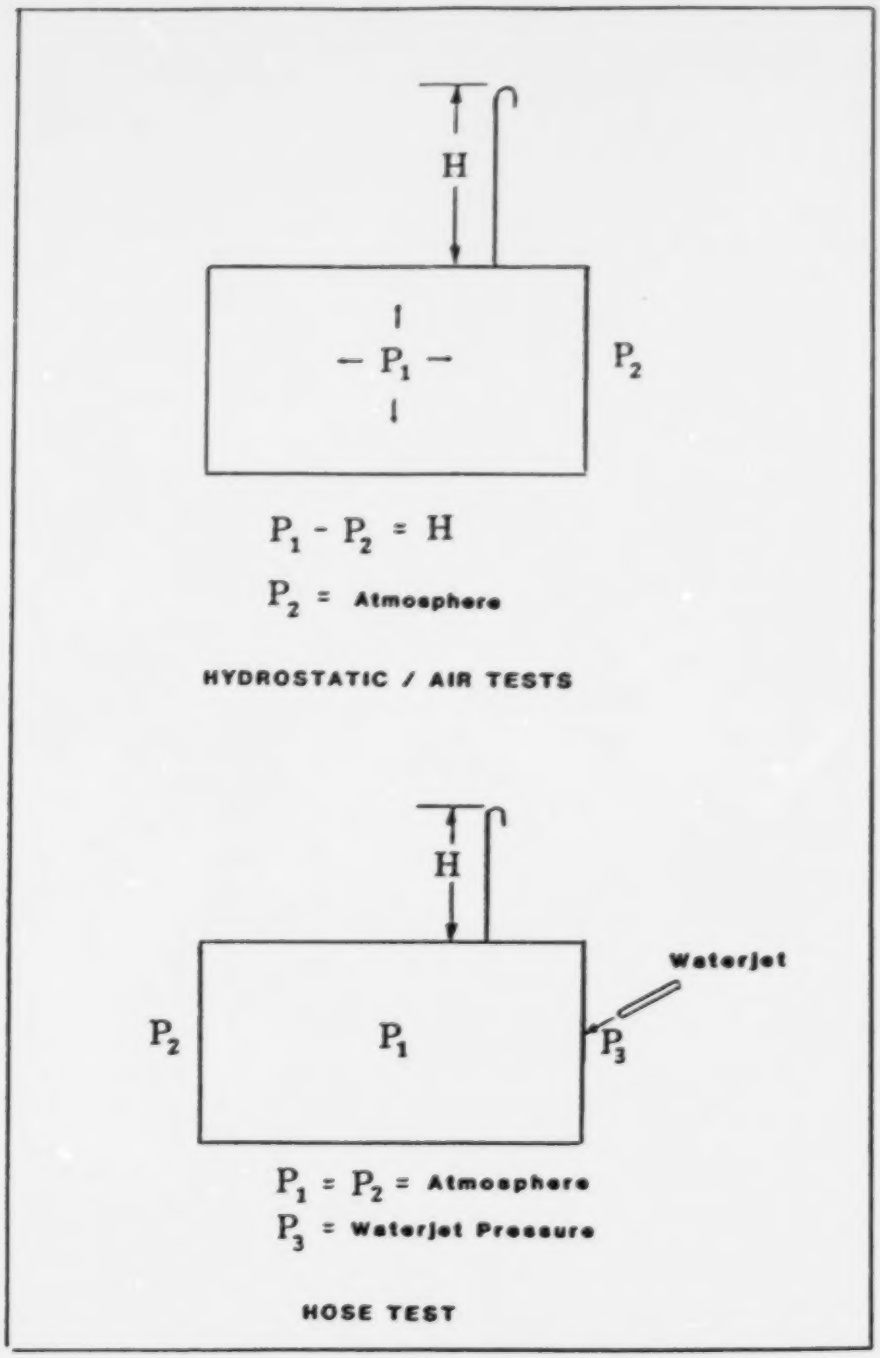
Hydrostatic Test Method

This method is used when tank loading test is required in addition to the weld tightness inspection. The tank is filled with water and external weld seams are inspected to locate wet spots which are indicative of leaking welds.

Hose Test Method

This method is sometimes used to check weld tightness when air and hydrostatic tests are impractical. A water jet is aimed at the weld seam and inspection carried out at the other side to find wet spots which are indicative of leaks. This method is not reliable as small leaks cannot reliably be detected.

All the above methods use the pressure differential principle, where a pressure difference is created across the weld. Leaks are revealed by the presence of water spots in the case of hydrostatic and hose tests, or air bubbles using the air test method. The principle is illustrated in Figure 1.1.



AIR, HYDROSTATIC & HOSE TEST PRINCIPLE

FIGURE 1

3. JUSTIFICATION

The existing test methods lend to serious shortcomings. These are described as follows:

Air Test Method

a) Test can only be conducted on completion of steelwork. If leaks are detected, then additional work will be carried out in rectification, which could result in schedule delay.

b) Labour is required to blank off tank openings before testing, which have to be removed on completion. Risk is incurred on the subsequent removal of blanks, which if overlooked, could result in personnel injury and property damage, beside the added labour to remove the omitted blanks.

c) A safety valve is required to be installed when this method is used, to alleviate the danger of over pressure. This safety requirement is sometimes overlooked. There are many instances of recorded injuries to workers in the marine industry due to over pressure of tank spaces undergoing weld tightness inspections.

Hydrostatic Test Method

a) Additional dock blocks may be required if hydrostatic test is carried out in the drydock to support the additional weight.

b) Tests can only be carried out on completion of steelwork. If leaks are detected, then water has to be drained to below leaks for weld rectification and topped up for re-test. All in all a very cumbersome process.

c) Fresh water is a scarce resource in some parts of Canada, such as in the High Arctic.

d) The tank water could be contaminated by the previous cargo making subsequent disposal troublesome. Slop reception facilities are not widely available, especially in the Arctic.

e) In low ambient temperature, the tank water could freeze before the test is completed, making discharge a problem to be overcome.

Hose Test Method

a) Splashing water could damage equipment in the immediate vicinity of test.

b) A "hit or miss" test method, not entirely reliable.

These shortcomings were eliminated during development of a new proposed vacuum test method.

The new vacuum weld tightness inspection method has the following advantages:

a) Vacuum test can be conducted concurrently with steelwork allowing to shorten the ship's time in drydock.

b) No requirement to pressurize the tank, eliminating the risk of personnel injury and property damage.

c) No requirement to fill the tank with fresh water, which is very valuable advantage for the Northern operation.

d) For tanks where load bearing tests are to be carried out, the hydrostatic test is only required to be done once, regardless of number of leaks. These leaks can be checked using the vacuum method.

e) No requirement to seal off tank openings, leading to labour saving as well as eliminating the risk of temporary blanks being overlooked in the case of air test.

f) Vacuum test method can be conducted on flat, rolled and angle surfaces meeting practically all the weld surface requirements in marine industry.

g) Simple in operation, permits ship's crew to undertake test themselves in situation where shipyard repair crew is unavailable.

4. SCOPE OF WORK

The scope of work done on this project to develop a new weld tightness inspection method for the marine industry can be described as follows:

1. FEASIBILITY STUDY

After the contract was awarded the project began with the necessary calculations in order to determine the equivalent vacuum pressures to Classification Societies Rule requirements. These equivalent vacuum pressures are shown in Table 1.

Once required vacuum pressures were determined the market search for suitable vacuum equipment was performed. The requirements for vacuum equipment were established as follows:

- capability to produce required vacuum
- portability

Diaphragm Vacuum Pump, Model MOA-V112-AE was selected and its suitability for shipyard application was discussed with shipyard participants.

Preliminary design for vacuum jigs for flat and angled weld surface was done.

Potential sealing materials for vacuum jigs were identified.

2. VACUUM JIG DESIGN

After the feasibility Study and preliminary design for vacuum jigs was completed, the working drawings were produced and discussed with Classification Societies.

3. PROTOTYPES OF VACUUM JIGS AND VACUUM EQUIPMENT

Upon completion of design, prototypes of vacuum jigs were manufactured, vacuum equipment was assembled (Fig. 2), and in-house tests carried out on flat and angled welded surfaces. Two special samples of these surfaces were made by participating shipyard - one with proper welds, another one with defects.

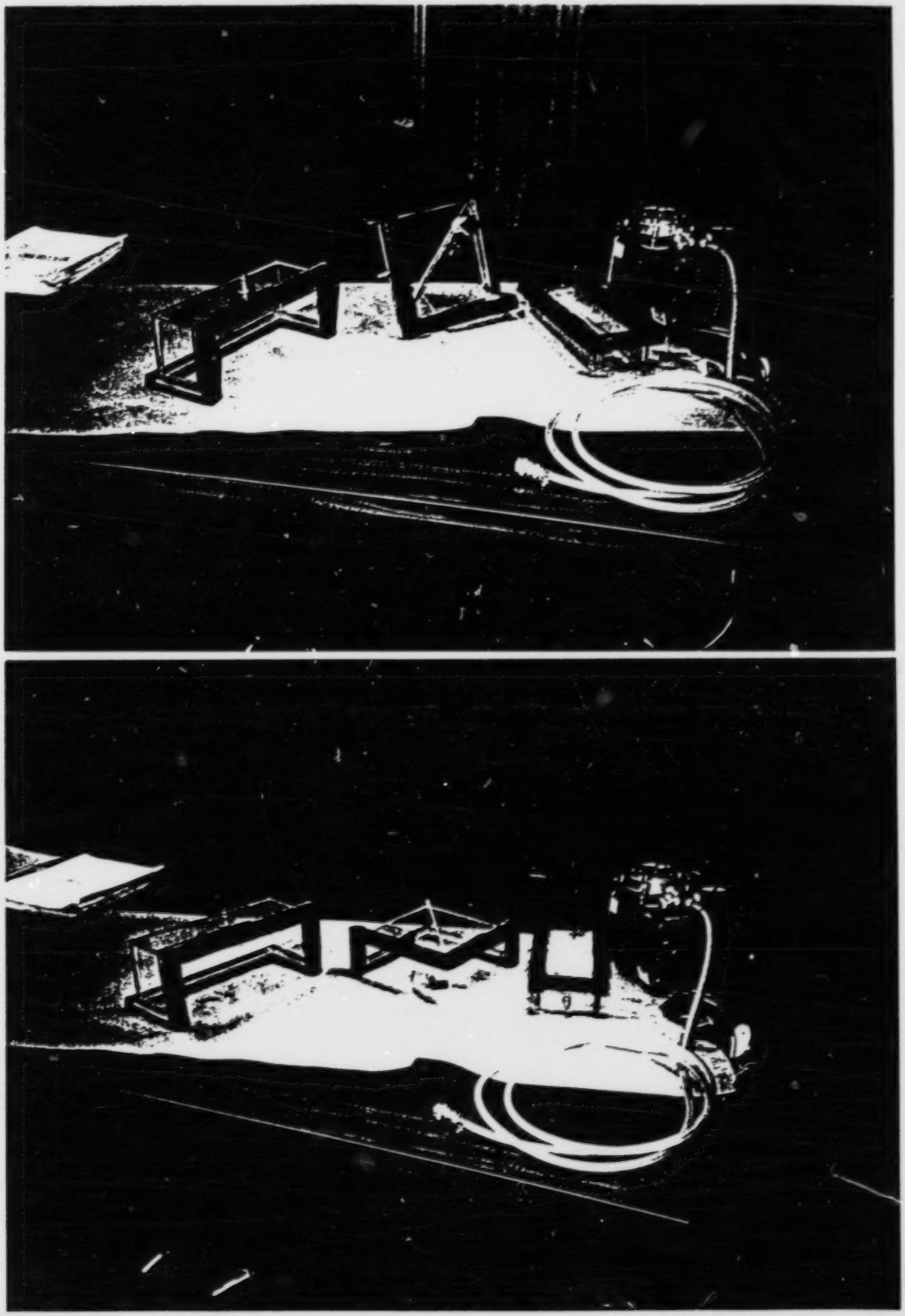


FIGURE 2

During these preliminary tests the following experience was gained:

1. Diaphragm Vacuum Pump, Model MOA-V112-AE was sufficient to provide required vacuum, but the decision was made to get vacuum pump model DOA-P101-FB with bigger air flow (Fig. 3)

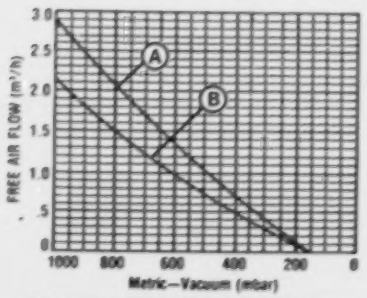
Model DOA Series

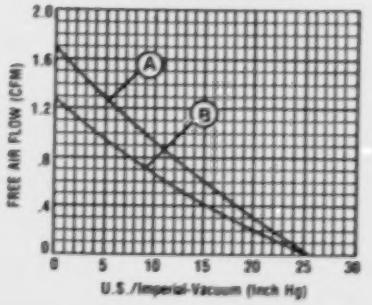
Oil-less, Motor Mounted (D.C. Motors)

INCLUDES
- Filter (Internal)
- Muffler

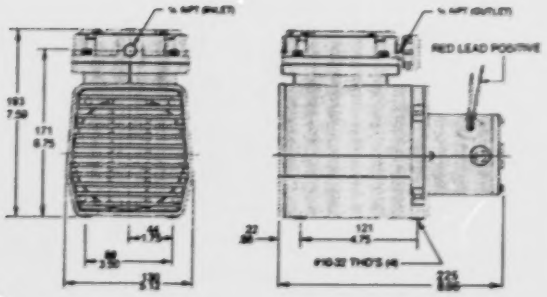
RECOMMENDED
- Vacuum Relief Valve AA550C-V
- Repair Kit K294A
- Rubber Feet AF584A (order 4)
- Carrying Handle AF885

OPTIONAL
- Anti-Corrosion Coatings (Internal)
- Chemical Resistant Diaphragms





Note: On all drawings Metric U.S./Imperial (Dimensions for reference only)



	Model No. Chart	Motor	RPM	HP	kW	Net Wt. lbs	Net Wt. kg
B	DOA-V111-JH	12 Volt D.C.	2100	1/6	0.09	12.75	5.80
A	DOA-V111-KH	12 Volt D.C.	3250	1/4	0.19	12.75	5.80
B	DOA-V111-JK	24 Volt D.C.	2100	1/6	0.09	12.75	5.80

FIGURE 3

2. Vacuum jig for 90° corner welded surface needed some modifications.

3. Better quality of sealing material was required.

Once all three deficiencies were rectified in-house trial was repeated again but this time all participating parties were invited. The tests on flat and angled welded surfaces were successfully carried out at this time.

The following was done during the tests:

Soapy water was applied to the flat surface with a proper weld. Vacuum jig was applied and required vacuum was created by adjusting a relief valve on the pump. No leaks were determined.

After soapy water was applied to the flat surface with a small defect in the weld. Vacuum jig was used again and required vacuum was created. The bubbles were coming out from the small hole in the weld, indicating the area of the defect.

The same procedure was repeated with angled surfaces.

All shipyards and Classification Societies Representatives approved vacuum weld inspection method and the following suggestions were made:

1. Testing equipment for flat surface should be enlarged (2-3 feet long).

2. Vacuum test will find a wide application in situations where hydrotest can not be used.

3. Vacuum test also can be used for testing prefabricated pipes in shop or existing pipes on board.

All parties agreed to carry out field test for final approval of new vacuum weld tightness method.

4. SHIPYARD DEMONSTRATIONS

Vacuum jig for flat welded surface was modified to suggested size (2 feet long) and field trials at the Vancouver Shipyard were carried out on April 19, 1989. Representatives from LR, DNV, ABS, VPSI and Vancouver Shipyard were present. Demonstration was once again successfully performed on the barge, which was under repair at that time.

Classification Societies Representatives made a final approval of the Vacuum Weld Inspection Method and provided official documents which are attached in Appendix A.

5. REVIEW OF DESIGN

After the completion of field trials the drawings of vacuum jigs were submitted for the final approval to the Classification Societies. Technical specification on the vacuum jigs and vacuum pump and arrangement was prepared and attached in Appendix B.

6. ARCTIC FIELD TRIALS

Because of lack of availability of actual Arctic Field repairs, arctic conditions were simulated at the B.C. Research Corp. facilities. Equipment was left inside the walk-in-freezer, where temperature was maintained at -19° C., which is much lower than we can anticipate in the Arctic during the period when any repair work can take place (May - October). The tests were carried out every two hours for the first six hours and then after 24 hours. It appeared that low temperature did not make any difference to the properties of sealing material used for vacuum jigs. The results of these trials proved that equipment can be successfully used in the Arctic.

APPENDIX A

Lloyd's Register

Lloyd's Register of Shipping
BC Rail Centre, Suite 502, 221 West Esplanade
North Vancouver BC, V7M 3J3
Phone (604) 985-0477
Fax (604) 985-0637

Wartsila Marine Inc.,
Suite 201,
1684 West 8th Avenue,
Vancouver, B. C.
V6J 1V4

Our ref IRM/g11

Your ref

Attention: Mr. Victor Mezheritsky

Date 8th May, 1989

VACUUM WELD TIGHTNESS INSPECTION METHOD
FOR THE MARINE INDUSTRY

Dear Sir:

We would refer to demonstrations of the above at your office, and at Vancouver Shipyards Co. Ltd.

This method has obvious advantages in repair work, as sealing tanks can be time consuming. There are also advantages in new construction in that shop floor panel welds can be tested in situ, and necessary repairs effected prior to erection.

Although this system has limitations, there are countless situations where it could be implimented.

Yours very truly,

IAN R. McNAB,
For the Surveyors

DET NORSKE VERITAS
ESTABLISHED 1864

DECLARATION

VACUUM WELD TIGHTNESS INSPECTION
R & D PROJECT DEVELOPED BY WARTSILA MARINE INC.

This is to certify that the subject R & D project concerning the use of vacuum test jigs for testing weld tightness in the ship building and ship repair has been submitted for consideration, review and acceptance to Det norske Veritas Classification A/S for use on projects/vessels classified and/or certified by the Society.

A prototype of Vacuum Jigs were made for use on the following types of welded surfaces:

- flat surface (e.g. shell plate and bulkhead seams)
- rolled surface (e.g. bilge roll seam)
- angled surface (e.g. bulkhead corner/seam)

Tests using soap solution and the prototype jigs were demonstrated in house with the vacuum pump creating the required pressure differential for simulating an air pressue of 20 KN/m2 (2.9 psi or 6.0" hg) inside the compartment whose weld is being tested, all in accordance to the air tightness test requirements of Det norske Veritas Rules for Classification of Steel Ships Part 3, Ch.1, Sec.1, D200.

A successful demonstration of use of the equipment in actual practice was carried out on a barge being repaired at Vancouver Shipyards Ltd.

Based on the demonstrations made and our findings, this method of testing of welds for tightness would be acceptable with the following reservations/limitations and subject to the approval of the same by Det norske Veritas Classification A/S Head Office at Oslo, Norway:-

- Linear length of weld being tested at any one time is not to exceed 1.0 m due to flexing of the plexiglass testing jig.
- The vacuum testing method would only be accepted for testing of repair welds, and used as a tool for checking of weld tightness during construction of new buildings or conversions.

It is agreed that save as provided below Det norske Veritas, its subsidiaries, bodies, officers, directors, employees and agents shall have no liability for any loss, damage or expense allegedly caused directly or indirectly by their mistake or negligence, breach of warranty, or any other act, omission or error by them, including gross negligence or wilful misconduct by any such person with the exception of gross negligence or wilful misconduct by the governing bodies or senior executive officers of Det norske Veritas. This applies regardless of whether the loss, damage or expense has affected anyone with whom Det norske Veritas has a contract or a third party who has acted or relied on decisions made or information given by or on behalf of Det norske Veritas. However, if any person uses the services of Det norske Veritas or its subsidiaries or relies on any decision made or information given by or on behalf of them and in consequence suffers a loss, damage or expense proved to be due to their negligence, omission or default, then Det norske Veritas will pay by way of compensation to such person a sum representing his proved loss. In the event Det norske Veritas or its subsidiaries may be held liable in accordance with the sections above, the amount of compensation shall under no circumstances exceed the amount of the fee, if any, charged for that particular service, decision, advice or information. Under no circumstances whatsoever shall the individual or individuals who have personally caused the loss, damage or expense be held liable. In the event that any provision in this section shall be invalid under the law of any jurisdiction, the validity of the remaining provisions shall not in any way be affected.

- This testing method will not substitute hydrostatic testing required by the society's Rules for testing structures and tightness on new buildings and existing vessels.

For Det norske Veritas Classification A/S

O. R. Hatlen
Principal Surveyor

S. Behramfram
Senior Surveyor

Vancouver, B. C.
May 8, 1989

AMERICAN BUREAU OF SHIPPING

Suite 301 - B.C. Rail Centre, 221 West Esplanade,
North Vancouver, B.C., Canada V7M 3J3

Telephone: (604) 984-4367

Telex: 04-352646
Fax: (604) 984-7686

9 May 1989

Wartsila Marine Inc.
Suite 201 - 1684 West 8th Ave.
Vancouver, B.C. V6J 1V4

Attention: Mr. Victor Mezheritsky, Project Engineer

Dear Sirs:

Re : VACUUM WELD TIGHTNESS INSPECTION METHOD

This is to advise that, having witnessed

a) model testing of the vacuum weld tightness inspection equipment at the offices of Wartsila Marine Inc., Vancouver on 16th February 1989, and

b) practical field testing of the vacuum weld tightness inspection equipment on a barge under repair at Vancouver Shipyards Co. Ltd., North Vancouver on 19th April 1989,

the vacuum weld tightness inspection methods proposed by Wartsila Marine Inc. are considered satisfactory in conjunction with other methods required by section 27 of the Rules for Building and Classing Steel Vessels during repair or new construction of vessels classed with this Bureau.

Very truly yours,

AMERICAN BUREAU OF SHIPPING

G. Fenwick, Manager - Western Canada

GF/jg

Lloyd's Register

Lloyd's Register of Shipping
BC Rail Centre, Suite 502, 221 West Esplanade
North Vancouver BC, V7M 3J3
Phone (604) 985-0477
Fax (604) 985-0637

Wartsila Marine Inc.,
Suite 201,
1684 West 8th Avenue,
Vancouver, B. C.
V6J 1V4

Attention: Mr. Victor Mezheritsky,
Project Engineer

Our ref IRM/g11

Your ref

Date 7th July, 1989

VACUUM WELD TIGHTNESS INSPECTION
METHOD FOR THE MARINE INDUSTRY

Dear Sir:

We acknowledge receipt of your letter of 16th June, 1989 enclosing three copies of the following plan for our consideration and approval:

Dwg. No. - Vacuum Jigs

One copy of the plan is returned herewith duly noted.

Yours very truly,

IAN R. McNAB,
Surveyor to Lloyd's
Register of Shipping

Encl.

JUN 30 1989

DET NORSKE
VERITAS

Det norske Veritas Classification A/S

ADDRESS 304 - 1200 LONSDALE AVENUE
NORTH VANCOUVER, B.C.
CANADA V7M 3H6

TELEPHONE (604) 985-7425 (24 HOUR SERVICE)

TELEX 04-352795

FAX (604) 985-7730

Wartsila Marine Inc.,
Suite 201-1684 West 8th Ave,
VANCOUVER, B.C.
V6J 1V4

Attn: V. Mezheritsky, Project Engineer

YOUR REF. OUR REF. DATE

June 28, 1989

Dear Sirs:

RE: VACUUM WELD TIGHTNESS INSPECTION METHOD FOR THE MARINE INDUSTRY

Reference is made to your letter dated June 16, 1989, with three copies of enclosed drawing:

"VACUUM JIGS"

Enclosed herewith please find two copies of the subject drawing stamped "Approved". May it please be noted that the date of approval marked on the drawing is the same as the date of our "Declaration" previously sent to you.

Very truly yours
DET NORSKE VERITAS CLASSIFICATION A/S

O.R. Hatlen
Principal Surveyor

S. Behramfram
Senior Surveyor

Encls.

It is agreed that save as provided below Det norske Veritas, its subsidiaries, bodies, officers, directors, employees and agents shall have no liability for any loss, damage or expense allegedly caused directly or indirectly by their mistake or negligence, breach of warranty, or any other act, omission or error by them, including gross negligence or wilful misconduct by any such person with the exception of gross negligence or wilful misconduct by the governing bodies or senior executive officers of Det norske Veritas. This applies regardless of whether the loss, damage or expense has affected anyone with whom Det norske Veritas has a contract or a third party who has acted or relied on decisions made or information given by or on behalf of Det norske Veritas. However, if any person uses the services of Det norske Veritas or its subsidiaries or relies on any decision made or information given by or on behalf of them and in consequence suffers a loss, damage or expense proved to be due to their negligence, omission or default, then Det norske Veritas will pay by way of compensation to such person a sum representing his proved loss. In the event Det norske Veritas or its subsidiaries may be held liable in accordance with the sections above, the amount of compensation shall under no circumstances exceed the amount of the fee, if any, charged for that particular service, decision, advice or information. Under no circumstances whatsoever shall the individual or individuals who have personally caused the loss, damage or expense be held liable. In the event that any provision in this section shall be invalid under the law of any jurisdiction, the validity of the remaining provisions shall not in any way be affected.

JUL 10 1989

AMERICAN BUREAU OF SHIPPING

Suite 301 - B.C. Rail Centre, 221 West Esplanade,
North Vancouver, B.C., Canada V7M 3J3

Telephone: (604) 984-4367

Telex: 04-352646
Fax: (604) 984-7686

6 July 1989

Wartsila Marine Inc.
Suite 201
1684 West 8th Avenue
Vancouver, B.C. V6J 1V4

Attention: Mr. Victor Mezheritsky
Project Engineer

Dear Sirs:

Re : Vacuum Weld Tightness Inspection
Method for the Marine Industry

This is to advise that vacuum jigs constructed as shown in Wartsila Marine Inc. drawing dated 20 March 1989, and as previously demonstrated at your office and a local shipyard would be acceptable for leak tightness inspections on vessels classed with this Bureau, in conjunction with other methods required by Section 27 of the "Rules for Building and Classing Steel Vessels".

Very truly yours

AMERICAN BUREAU OF SHIPPING

G.Fenwick, Manager, Western Canada

GF:gs
Encls.

APPENDIX B

TECHNICAL SPECIFICATION

Vacuum Jigs:

1. Material - clear acrylic.
   REZ-N-BOND #1 glue.
2. Felt.
3. 1/4" NPT Female pipe FD 40-1013.
4. 1/4" NPT Male pipe FD 40-1014.

Vacuum Pump and Arrangement:

1. Diaphragm vacuum pump, model DOA series, 115/110V, 4.5/4.8A, 60/50 H2.
2. 1/4" NPT nipple.
3. 1/4" NPT 102-B-cross.
4. 1/4" NPT AA550C-V relief valve.
5. 1/4" NPT AA640 cast vacuum gauge 0-30 in. Hg val./0-760 mm Hg val.
6. 1/4" NPT 125-4B hose carb.
7. 1/2" Tridon clamp.
8. 1/4" I.D. BBC Wainbee hose HN-30
9. 1/4" NPT socketless hose FD 43-1031.

EMPLOYEE E MAKINEN Week Ending APR 9 1989

Employee Number _____

Project	Phase	Labor Code	M		T		W		Th		F		S		Total Hours	
***	***	***	R	O/T	R	O/T	R	O/T	R	O/T	R	O/T	R	O/T	REG	O/T
330		800			8		8		4		6				26	
809		800	4						4						8	
343		800			3										3	
344		800					2		2						4	
304		200	3												3	
804		800	3								4				7	
VACATION 10.999 154				***		***		***		***		***		****		
HOLIDAY 10.999 155				***		***		***		***		***		****		
SICK 10.999 152				***		***		***		***		***		****		
TOTAL			10		11		10		10		10				51	

Remarks _____

_____

Staff Signature: EM Manager Approval _____

EMPLOYEE E. MAKINEN Week Ending APR 16 1989

Employee Number _____

Project	Phase	Labor Code	M		T		W		Th		F		S		Total Hours	
***	***	***	R	O/T	R	O/T	R	O/T	R	O/T	R	O/T	R	O/T	REG	O/T
321		800	1						1						2	
330		800	4		4		4		2		6				20	
343		800			2										2	
344		800	2				2		3		4				11	
304		200	2						2						4	
809		800	1		2				2						5	
700		100			2		4								6	
VACATION 10.999 154				***		***		***		***		***		****		
HOLIDAY 10.999 155				***		***		***		***		***		****		
SICK 10.999 152				***		***		***		***		***		****		
TOTAL			10		10		10		10		10				50	

Remarks _____

_____

Staff Signature: EM Manager Approval _____

EMPLOYEE E. MAKINEN Week Ending APR 23 1989

Employee Number _____

Project	Phase	Labor Code	M		T		W		Th		F		S		Total Hours	
***	***	***	R	O/T	R	O/T	R	O/T	R	O/T	R	O/T	R	O/T	REG	O/T
330		200	8		4		8				2				22	
809		800			2						4				6	
304		200			4										4	
343		800							6		2				8	
~~344~~		~~800~~														
700		100					2		2						4	
321		800	2												2	
VACATION 10.999 154				*** ***		*** ***		*** ***		*** ***		*** ***		**** ****		
HOLIDAY 10.999 155				*** *** ***		*** *** ***		*** *** ***		*** *** ***		*** *** ***		**** **** ****		
SICK 10.999 152				***		***		***		***		***		****		
TOTAL			10		10		10		8		8		~~4~~		46	

Remarks _____

_____

Staff Signature: EM Manager Approval _____

EMPLOYEE E. MAKINEN Week Ending MAY 7 1989

Employee Number _____

Project	Phase	Labor Code	M		T		W		Th		F		S		Total Hours	
***	***	***	R	O/T	R	O/T	R	O/T	R	O/T	R	O/T	R	O/T	REG	O/T
344		800	4		4				4						12	
304		200			4										4	
343		800					4								4	
330		800	4				2		4		6				16	
700		100					2				2				4	
809		800									2				2	
VACATION 10.999 154				***		***		***		***		***		****		
HOLIDAY 10.999 155				***		***		***		***		***		****		
SICK 10.999 152				***		***		***		***		***		****		
TOTAL				8		8		8		8		10			40	

Remarks _____

_____

Staff Signature: _____ Manager Approval _____

EMPLOYEE E MAKINEN Week Ending MAY 14 1989

Employee Number _____

Project	Phase	Labor Code	M		T		W		Th		F		S		Total Hours	
***	***	***	R	O/T	R	O/T	R	O/T	R	O/T	R	O/T	R	O/T	REG	O/T
330		800	4		4		4		6						18	
304		200			4		4								8	
312		800							4		6				10	
319		200							2						2	
326		800	6												6	
343		800			4										4	
344		800									4				4	
809		800					4								4	
VACATION 10.999 154				***		***		***		***		***		****		
HOLIDAY 10.999 155				***		***		***		***		***		****		
SICK 10.999 152				***		***		***		***		***		****		
TOTAL			10		12		12		12		10				56	

Remarks _____

_____

Staff Signature: ETM Manager Approval _____

EMPLOYEE E. MAKINEN Week Ending MAY 21 1989

Employee Number _____

Project	Phase	Labor Code	M		T		W		Th		F		S		Total Hours	
***	***	***	R	O/T	R	O/T	R	O/T	R	O/T	R	O/T	R	O/T	REG	O/T
330		800	2		2		3		2		2				11	
343		800			4				4		4				12	
344		800	2												2	
312		800	2		2		2		2		2				10	
304		200					3								3	
809		800	2												2	
342		800	2												2	
VACATION 10.999 154				***		***		***		***		***		****		
HOLIDAY 10.999 155				***		***		***		***		***		****		
SICK 10.999 152				***		***		***		***		***		****		
TOTAL			10		8		8		8		8				42	

Remarks _____

_____

Staff Signature: _____ Manager Approval _____

EMPLOYEE E. MAKINEN Week Ending MAY 28 1989

Employee Number _____

Project	Phase	Labor Code	M		T		W		Th		F		S		Total Hours	
***	***	***	R	O/T	R	O/T	R	O/T	R	O/T	R	O/T	R	O/T	REG	O/T
344		800	8						4		4				16	
343		800			2		6								8	
809		800			2				2						4	
304		800			2						2				4	
330		800			4		4		2		2				12	
VACATION 10.999 154				***		***		***		***		***		****		
HOLIDAY 10.999 155				***		***		***		***		***		****		
SICK 10.999 152				***		***		***		***		***		****		
TOTAL			8		10		10		8		8				44	

Remarks _____

_____

Staff Signature: EM Manager Approval _____

EMPLOYEE E. MAKINEN Week Ending Jun 4 1989

Employee Number _____

Project	Phase	Labor Code	M May 29		T 30		W 31		Th Jun 1		F 2		S		Total Hours	
***	***	***	R	O/T	R	O/T	R	O/T	R	O/T	R	O/T	R	O/T	REG	O/T
312		800	2								1				3	
330		800	2		3		1		1		3				10	
304		200			2		2								4	
343		800					7		7						14	
344		800	6								6				12	
700		100			3										3	
VACATION 10.999 154				***		***		***		***		***		****		
HOLIDAY 10.999 155				***		***		***		***		***		****		
SICK 10.999 152				***		***		***		***		***		****		
TOTAL			10		8		10		8		10				46	

Remarks _____

_____

Staff Signature: E.M. Manager Approval _____

EMPLOYEE E. MAKINEN Week Ending JUN 11 1989

Employee Number _____

Project	Phase	Labor Code	M		T		W		Th		F		S		Total Hours	
***	***	***	R	O/T	R	O/T	R	O/T	R	O/T	R	O/T	R	O/T	REG	O/T
809		800	2				2								4	
330		800	6		2		2								10	
312		800	2		1										3	
344		800			7										7	
314		800					2				2		2		6	
343		800					4		8		2				14	
304		200									6				6	
VACATION 10.999 154				*** *** *** *** ***		*** *** *** *** ***		*** *** *** *** ***		*** *** *** *** ***		*** *** *** *** ***		**** **** **** **** ****		
HOLIDAY 10.999 155																
SICK 10.999 152																
TOTAL			10		10		10		8		10		2		50	

Remarks _____

_____

Staff Signature: EM Manager Approval _____

EMPLOYEE E MAKINEN Week Ending Jul 9 1989

Employee Number _____

Project	Phase	Labor Code	M		T		W		Th		F		S		Total Hours	
***	***	***	R	O/T	R	O/T	R	O/T	R	O/T	R	O/T	R	O/T	REG	O/T
312		800	1												1	
328		800	3				2								5	
700		100	4												4	
304		200			8										8	
VACATION 10.999 154				***		***	6	***	8	***	8	***		****	20	
HOLIDAY 10.999 155				***		***		***		***		***		****		
SICK 10.999 152				***		***		***		***		***		****		
TOTAL			8		8		8		8		8					

Remarks _____

_____

Staff Signature: EM Manager Approval _____

EMPLOYEE E. MAKINEN Week Ending Aug 6 1989

Employee Number _____

Project	Phase	Labor Code	M		T		W		Th		F		S		Total Hours	
			Aug 1		2		3		4		5					
***	***	***	R	O/T	R	O/T	R	O/T	R	O/T	R	O/T	R	O/T	REG	O/T
344		800			8										8	
328		800					4								4	
304		200					4				8				12	
809		800							4						4	
700		100							4						4	
VACATION 10.999 154				***		***		***		***		***		****		
HOLIDAY 10.999 155				***		***		***		***		***		****		
SICK 10.999 152				***		***		***		***		***		****		
TOTAL					8		8		8		8				32	

Remarks _____

_____

Staff Signature: EM Manager Approval: _____

EMPLOYEE E. MAKINEN Week Ending AUG 13 1989

Employee Number _____

Project	Phase	Labor Code	M		T		W		Th		F		S		Total Hours	
***	***	***	R	O/T	R	O/T	R	O/T	R	O/T	R	O/T	R	O/T	REG	O/T
328		800	2		2		4		2		2				12	
809		800	2						2						4	
304		200			8						6				14	
344		800	4						4						8	
343		800					6								6	
VACATION 10.999 154				***		***		***		***		***		****		
HOLIDAY 10.999 155				***		***		***		***		***		****		
SICK 10.999 152				***		***		***		***		***		****		
TOTAL			8		10		10		8		8				44	

Remarks _____

_____

Staff Signature: RM Manager Approval _____

EMPLOYEE E MÄKINEN Week Ending AUG 20 1989

Employee Number _____

Project	Phase	Labor Code	M		T		W		Th		F		S		Total Hours	
***	***	***	R	O/T	R	O/T	R	O/T	R	O/T	R	O/T	R	O/T	REG	O/T
328		800	5		8		8		8		8				37	
304		200	3												3	
VACATION 10.999 154				***		***		***		***		***		****		
HOLIDAY 10.999 155				***		***		***		***		***		****		
SICK 10.999 152				***		***		***		***		***		****		
TOTAL				8		8		8		8		8			40	

Remarks _____

_____

Staff Signature: EM Manager Approval _____

EMPLOYEE E. MAKINEN Week Ending AUG 27 1989

Employee Number _____

Project	Phase	Labor Code	M		T		W		Th		F		S		Total Hours	
***	***	***	R	O/T	R	O/T	R	O/T	R	O/T	R	O/T	R	O/T	REG	O/T
328		800	2						4						6	
379		200	2				2				2				6	
344		200			4										4	
343		200	4		4				4						12	
304		200					4				6				10	
312		200					2								2	
VACATION 10.999 154				***		***		***		***		***		****		
HOLIDAY 10.999 155				***		***		***		***		***		****		
SICK 10.999 152				***		***		***		***		***		****		
TOTAL			8		8		8		8		8				40	

Remarks _____

_____

Staff Signature: EM Manager Approval _____

EMPLOYEE Peter Noble Week Ending May 7 1989

Employee Number PN

Project	Phase	Labor Code	M		T		W		Th		F		S		Total Hours	
***	***	***	R	O/T	R	O/T	R	O/T	R	O/T	R	O/T	R	O/T	REG	O/T
344			4		4		4		2						14	
796									2		8				10	
364			5		5		5		5						20	
VACATION 10.999 154				***		***		***		***		***		****		
HOLIDAY 10.999 155				***		***		***		***		***		****		
SICK 10.999 152				***		***		***		***		***		****		
TOTAL			9		9		9		9		8					

Remarks _____

Staff Signature: _____ Manager Approval _____

Employee: Peter Noble Week Ending: June 4, 1989

Employee Number: PN Payroll Ending _____, 1989

Rate of Pay: $ _____

1 2 3 4

	Project	Phase	Labour Code	M		Tu		W		Th		F		Sa		Su		Total Hours		Total $'s
	***	***	***	R	O/T	R	O/T	R	O/T	R	O/T	R	O/T	R	O/T	R	O/T	REG	O/T	
20	383		160							2		2						4		
20	389		160							2		2						4		
20	390		160							1		1						2		
20	366		160							1		1						2		
20	304		201							1		-						1		
20	372		160							2		4						6		
VACATION 10.999/154																				
HOLIDAY 10.999/155																				
SICK LEAVE 10.999/152																				
TOTAL										9		10						19		

Remarks: _____

Staff Signature: _____ Manager Approval _____

EMPLOYEE Peter Noble Week Ending Aug 6 1989

Employee Number PN

Project	Phase	Labor Code	M		T		W		Th		F		S		Total Hours	
***	***	***	R	O/T	R	O/T	R	O/T	R	O/T	R	O/T	R	O/T	REG	O/T
388					2		2		2		2				8	
387					2		2								4	
379					2		2		2		2				8	
397					2		2		2		2				8	
306					1		1		3		3				8	
VACATION 10.999 154				***		***		***		***		***		****		
HOLIDAY 10.999 155				***		***		***		***		***		****		
SICK 10.999 152				***		***		***		***		***		****		
TOTAL					9		9		9		9					

Remarks _____

Staff Signature: _____ Manager Approval _____

EMPLOYEE Peter Noble Week Ending Aug 13 1989

Employee Number _____

Project	Phase	Labor Code	M		T		W		Th		F		S		Total Hours	
***	***	***	R	O/T	R	O/T	R	O/T	R	O/T	R	O/T	R	O/T	REG	O/T
352					8		10		10						28	
397											8				8	
304			8												8	
VACATION 10.999 154				***		***		***		***		***		****		
HOLIDAY 10.999 155				***		***		***		***		***		****		
SICK 10.999 152				***		***		***		***		***		****		
TOTAL			8		8		10		10		8					

Remarks _____

Staff Signature: _____ Manager Approval _____

EMPLOYEE Peter Nicholas Week Ending Aug 27 1989

Employee Number _____

Project	Phase	Labor Code	M		T		W		Th		F		S		Total Hours	
***	***	***	R	O/T	R	O/T	R	O/T	R	O/T	R	O/T	R	O/T	REG	O/T
326			9		4										13	
304			~~8~~		5		9								14	
389									9		4				13	
388											4				4	
700									1		2				2	
VACATION 10.999 154			***		***		***		***		***		****			
HOLIDAY 10.999 155			***		***		***		***		***		****			
SICK 10.999 152			***		***		***		***		***		****			
TOTAL			9		9		9		10		10				47	

Remarks _____

Staff Signature: _____ Manager Approval _____

EMPLOYEE V. Mezheritsky Week Ending 9 April 1989

Employee Number _____

Project	Phase	Labor Code	M		T		W		Th		F		S		Total Hours	
***	***	***	R	O/T	R	O/T	R	O/T	R	O/T	R	O/T	R	O/T	REG	O/T
20.359		160					8		7		5				20	
82.354		802							1						1	
86.328		806									3				3	
20.304		200			8										8	
VACATION	10.999	154		***		***		***		***		***		****		
HOLIDAY	10.999	155		***		***		***		***		***		****		
SICK	10.999	152	8	***		***		***		***		***		****	8	
TOTAL				8		8		8		8		8			40	

Remarks _____

Staff Signature: _____ Manager Approval _____

EMPLOYEE V. Mezhericsky Week Ending 23 April 1989

Employee Number _____

Project	Phase	Labor Code	M		T		W		Th		F		S		Total Hours	
***	***	***	R	O/T	R	O/T	R	O/T	R	O/T	R	O/T	R	O/T	REG	O/T
20.339		204	1												1	
20.359		160	6				4								10	
86.328		823	1				1		8						10	
20.304		212			8		3								11	
VACATION 10.999 154				***		***		***		***		***		****		
HOLIDAY 10.999 155				***		***		***		***		***		****		
SICK 10.999 152				***		***		***		***		***		****		
TOTAL			8		8		8		8		*				32	

Remarks _____

Staff Signature: _____ Manager Approval _____

* FRIDAY OFF.

EMPLOYEE V. Mezhiritsny Week Ending 30 APR. 1989

Employee Number _____

Project	Phase	Labor Code	M		T		W		Th		F		S		Total Hours	
***	***	***	R	O/T	R	O/T	R	O/T	R	O/T	R	O/T	R	O/T	REG	O/T
86.328		816	8		8				8						24	
20.304		200					8			8					16	
VACATION 10.999 154				***		***		***		***		***		****		
HOLIDAY 10.999 155				***		***		***		***		***		****		
SICK 10.999 152				***		***		***		***		***		****		
TOTAL			8		8		8		8		8				40	

Remarks _____

Staff Signature: _____ Manager Approval _____

EMPLOYEE V. Mezhericsky Week Ending 7 MAY 1989

Employee Number _____

Project	Phase	Labor Code	M		T		W		Th		F		S		Total Hours	
***	***	***	R	O/T	R	O/T	R	O/T	R	O/T	R	O/T	R	O/T	REG	O/T
86.328		816	8				8								16	
20.304		200			8				8		8				24	
VACATION 10.999 154				*** *** *** *** ***		*** *** *** *** ***		*** *** *** *** ***		*** *** *** *** ***		*** *** *** *** ***		**** **** **** **** ****		
HOLIDAY 10.999 155																
SICK 10.999 152																
TOTAL			8		8		8		8		8				40	

Remarks _____

Staff Signature: _____ Manager Approval _____

EMPLOYEE V. Mezheritsky Week Ending 14 May 1989

Employee Number _____

Project	Phase	Labor Code	M		T		W		Th		F		S		Total Hours	
***	***	***	R	O/T	R	O/T	R	O/T	R	O/T	R	O/T	R	O/T	REG	O/T
86.328		816	8						8		8				24	
20.304		200			8		8								16	
VACATION 10.999 154				***		***		***		***		***		****		
HOLIDAY 10.999 155				***		***		***		***		***		****		
SICK 10.999 152				***		***		***		***		***		****		
TOTAL			8		8		8		8		8				40	

Remarks _____

Staff Signature: _____ Manager Approval _____

EMPLOYEE V. Mezheritsky Week Ending 21 May 1989

Employee Number _____

Project	Phase	Labor Code	M		T		W		Th		F		S		Total Hours	
***	***	***	R	O/T	R	O/T	R	O/T	R	O/T	R	O/T	R	O/T	REG	O/T
86.328		816	8						8						16	
20.304		200			8		8								16	
VACATION 10.999 154				***		***		***		***		***		****		
HOLIDAY 10.999 155				***		***		***		***		***		****		
SICK 10.999 152				***		***		***		***		***		****		
TOTAL			8		8		8		8		*				32	

Remarks _____

Staff Signature: _____ Manager Approval _____

* FRIDAY OFF

EMPLOYEE: V. MEZHERITSKY Week Ending: June 18, 1988

Employee Number: _____ Payroll Ending _____, 1988

Project	Phase	Labour Code	M		Tu		W		Th		F		Sa		Su		Total Hours		Total S's
***	***	***	R	O/T	R	O/T	R	O/T	R	O/T	R	O/T	R	O/T	R	O/T	REG	O/T	
20.339		204	2				1		3								6		
20.304		216	6		8		7		5		4						~~30~~		
VACATION 10.999/154																			
HOLIDAY 10.999/155																			
SICK LEAVE 10.999/152																			
TOTAL			8		8		8		8		4						36		

Remarks: _____

Staff Signature: Vlezher Manager Approval _____

EMPLOYEE: V. MEZHERITSKY Week Ending: 25 June, 1989

Employee Number: _____ Payroll Ending _____, 1988

Project	Phase	Labour Code	M		Tu		W		Th		F		Sa		Su		Total Hours		Total $'s
***	***	***	R	O/T	R	O/T	R	O/T	R	O/T	R	O/T	R	O/T	R	O/T	REG	O/T	
20.304		216	6		5		8				6						25		
20.339		204	2		3						2						7		
VACATION 10.999/154									8								8		
HOLIDAY 10.999/155																			
SICK LEAVE 10.999/152																			
TOTAL			8		8		8		8		8						40		

Remarks: _____

Staff Signature: _____ Manager Approval _____

EMPLOYEE: V. MEZHERITSKY Week Ending: 2 July, 1989

Employee Number: _____ Payroll Ending _____, 1988

Project	Phase	Labour Code	M		Tu		W		Th		F		Sa		Su		Total Hours		Total $'s
***	***	***	R	O/T	R	O/T	R	O/T	R	O/T	R	O/T	R	O/T	R	O/T	REG	O/T	
20.304		216	6				5		7								18		
20.379		204	2		8		2		1								13		
20.339		204					1										1		
VACATION 10.999/154																			
HOLIDAY 10.999/155																			
SICK LEAVE 10.999/152																			
TOTAL			8		8		8		8		*						32		

Remarks: _____

Staff Signature: _____ Manager Approval _____

EMPLOYEE: V. MEZHERITSKY Week Ending: 9 July, 1989

Employee Number: _____ Payroll Ending _____, 1988

Project	Phase	Labour Code	M		Tu		W		Th		F		Sa		Su		Total Hours		Total $'s
***	***	***	R	O/T	R	O/T	R	O/T	R	O/T	R	O/T	R	O/T	R	O/T	REG	O/T	
20.339	200	204/212			2		2		8		8						20		
20.304	200	216			4		6										10		
20.379	200	204			2												2		
VACATION 10.999/154																			
HOLIDAY 10.999/155			8 (Canada Day)														8		
SICK LEAVE 10.999/152																			
TOTAL			8		8		8		8		8						40		

Remarks: _____

Staff Signature: _____ Manager Approval _____

EMPLOYEE V. Mezhentsev Week Ending 16 July 1989

Employee Number _____

Project	Phase	Labor Code	M		T		W		Th		F		S		Total Hours	
***	***	***	R	O/T	R	O/T	R	O/T	R	O/T	R	O/T	R	O/T	REG	O/T
20.339		204/216	8				5		8		2				23	
20.388		204					1				6				7	
20.375		204					2								2	
20.304		200			8										8	
VACATION 10.999 154				***		***		***		***		***		****		
HOLIDAY 10.999 155				***		***		***		***		***		****		
SICK 10.999 152				***		***		***		***		***		****		
TOTAL				8		8		8		8		8				40

Remarks _____

Staff Signature: _____ Manager Approval _____

EMPLOYEE V. Mezheritsuy Week Ending 23 July 1989

Employee Number _____

Project	Phase	Labor Code	M		T		W		Th		F		S		Total Hours	
***	***	***	R	O/T	R	O/T	R	O/T	R	O/T	R	O/T	R	O/T	REG	O/T
20.362		153	8		8										16	
20.388		200							8						8	
20.304		200					8								8	
VACATION 10.999 154			***		***		***		***		***		****			
HOLIDAY 10.999 155			***		***		***		***		***		****			
SICK 10.999 152			***		***		***		***		***		****			
TOTAL			8		8		8		8		*				32	

Remarks _____

Staff Signature: _____ Manager Approval _____

* FRIDAY OFF.

EMPLOYEE V. Mezheritsky Week Ending 30 July 1989

Employee Number _____

Project	Phase	Labor Code	M		T		W		Th		F		S		Total Hours	
***	***	***	R	O/T	R	O/T	R	O/T	R	O/T	R	O/T	R	O/T	REG	O/T
20.304		200	8		8		8		8		8				40	
VACATION 10.999 154				***		***		***		***		***		****		
HOLIDAY 10.999 155				***		***		***		***		***		****		
SICK 10.999 152				***		***		***		***		***		****		
TOTAL			8		8		8		8		8				40	

Remarks _____

Staff Signature: _____ Manager Approval _____

EMPLOYEE V. Mezheritsky Week Ending 6 August 1989

Employee Number _____

Project	Phase	Labor Code	M		T		W		Th		F		S		Total Hours	
***	***	***	R	O/T	R	O/T	R	O/T	R	O/T	R	O/T	R	O/T	REG	O/T
20.388		200			8				8		8				24	
20.304		200					8								8	
VACATION 10.999 154			***		***		***		***		***		****			
HOLIDAY 10.999 155			***		***		***		***		***		****			
SICK 10.999 152			***		***		***		***		***		****			
TOTAL					8		8		8		8				32	

Remarks _____

Staff Signature: _____ Manager Approval _____

EMPLOYEE V. Mezheritsky Week Ending 20 August 1989

Employee Number _____

Project	Phase	Labor Code	M		T		W		Th		F		S		Total Hours	
***	***	***	R	O/T	R	O/T	R	O/T	R	O/T	R	O/T	R	O/T	REG	O/T
20.304.		200	8		8		8		8		8				40	
VACATION 10.999 154				***		***		***		***		***		****		
HOLIDAY 10.999 155				***		***		***		***		***		****		
SICK 10.999 152				***		***		***		***		***		****		
TOTAL			8		8		8		8		8				40	

Remarks _____

Staff Signature: _____ Manager Approval _____

EMPLOYEE V. Mezheritsky Week Ending 27 Aug 1989

Employee Number _____

Project	Phase	Labor Code	M		T		W		Th		F		S		Total Hours	
***	***	***	R	O/T	R	O/T	R	O/T	R	O/T	R	O/T	R	O/T	REG	O/T
20.388		204	8						8		8				24	
20.304		200			8		8								16	
VACATION 10.999 154				*** *** *** *** ***		*** *** *** *** ***		*** *** *** *** ***		*** *** *** *** ***		*** *** *** *** ***		**** **** **** **** ****		
HOLIDAY 10.999 155																
SICK 10.999 152																
TOTAL			8		8		8		8		8				40	

Remarks _____

Staff Signature: _____ Manager Approval _____

EMPLOYEE JOHN AVIS Week Ending JULY 16 1989

Employee Number JSA

Project	Phase	Labor Code	M		T		W		Th		F		S		Total Hours	
***	***	***	R	O/T	R	O/T	R	O/T	R	O/T	R	O/T	R	O/T	REG	O/T
20.319			2.0		4.0		8.0		8.0						22.0	
20.379			6.0		1.0										7.0	
20.304		[illegible]			3.0										3.0	
VACATION 10.999 154				***		***		***		***		***		****		
HOLIDAY 10.999 155				***		***		***		***		***		****		
SICK 10.999 152				***		***		***		***		***		****		
TOTAL																

Remarks FRIDAY OFF

Staff Signature: John Avis Manager Approval

EMPLOYEE JOHN AVIS Week Ending July 23 1989

Employee Number JSA

Project	Phase	Labor Code	M		T		W		Th		F		S		Total Hours	
***	***	***	R	O/T	R	O/T	R	O/T	R	O/T	R	O/T	R	O/T	REG	O/T
20.319			5		4		2								11	
20.304			1		4		1								6	
20.387			2				5	4	8	5	8	6.5	[illegible]	6.0	23	21.5
VACATION 10.999 154			***		***		***		***		***		****			
HOLIDAY 10.999 155			***		***		***		***		***		****			
SICK 10.999 152			***		***		***		***		***		****			
TOTAL			8.0		8.0		12.0		13.0		14.5		6.0		61.5	

Remarks O/T FOR COAST GUARD STABILITY PROJECT

Staff Signature: John Avis Manager Approval

EMPLOYEE John Ams Week Ending July 30 1989

Employee Number JSA

Project	Phase	Labor Code	M		T		W		Th		F		S		Total Hours	
***	***	***	R	O/T	R	O/T	R	O/T	R	O/T	R	O/T	R	O/T	REG	O/T
379									3.0						3.0	
319			5		4		4.5		1.5						15.0	
387			1		1		2				4.0				8.0	
10.999		153	1												1.0	
304					3		1.5		3.5						8.0	
388											4.0				4.0	
VACATION 10.999 154				***		***		***		***		***		****		
HOLIDAY 10.999 155				***		***		***		***		***		****		
SICK 10.999 152				***		***		***		***		***		****		
TOTAL			7.0		8.0		8.0		8.0		8.0				39.0	

Remarks _____

Staff Signature: John Ams Manager Approval _____

EMPLOYEE MICHAEL WADDEN Week Ending 28 MAY 1989

Employee Number _____

Project	Phase	Labor Code	M		T		W		Th		F		S		Total Hours	
***	***	***	R	O/T	R	O/T	R	O/T	R	O/T	R	O/T	R	O/T	REG	O/T
20.309		214							2				1.5		3.5	
20.309		209					2		3.5						5.5	
20.265	6	217			6		1								7	
20.304		200			2						6				8	
20.315		209					5								5	
VACATION 10.999 154				***		***		***		***		***		****		
HOLIDAY 10.999 155			8	***		***		***		***		***		****	8	
SICK 10.999 152				***		***		***	4.5	***		***		****	4.5	
TOTAL			8		8		8		8		8		1.5		41.5	

Remarks _____

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Staff Signature: Michael Wadden Manager Approval _____

EMPLOYEE MICHAEL WADDEN Week Ending 18 JUNE 1989

Employee Number _____

Project	Phase	Labor Code	M		T		W		Th		F		S		Total Hours	
***	***	***	R	O/T	R	O/T	R	O/T	R	O/T	R	O/T	R	O/T	REG	O/T
20.375		209	6		6		8		4		2				26	
20.304		200	2		2				4		6				14	
VACATION 10.999 154				***		***		***		***		***		****		
HOLIDAY 10.999 155				***		***		***		***		***		****		
SICK 10.999 152				***		***		***		***		***		****		
TOTAL				8		8		8		8		8			40	

Remarks _____

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Staff Signature: Michael Wadden Manager Approval _____

EMPLOYEE MICHAEL WADDEN Week Ending 30 JUNE 1989

Employee Number _____

Project	Phase	Labor Code	M		T		W		Th		F		S		Total Hours	
***	***	***	R	O/T	R	O/T	R	O/T	R	O/T	R	O/T	R	O/T	REG	O/T
20.379		209	8		7		5		6.5		4.5				31	
20.341	1	209			1										1	
20.304		200					7								7	
VACATION 10.999 154				***		***		***		***		***		****		
HOLIDAY 10.999 155				***		***		***		***		***		****		
SICK 10.999 152				***		***		***		***		***		****		
TOTAL			8		8		12		6.5		4.5				39	

Remarks _____

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Staff Signature: Michael Wadden Manager Approval _____

EMPLOYEE MICHAEL WADDEN Week Ending 9 JULY 1989

Employee Number _____

Project	Phase	Labor Code	M		T		W		Th		F		S		Total Hours	
***	***	***	R	O/T	R	O/T	R	O/T	R	O/T	R	O/T	R	O/T	REG	O/T
20.304		200			8		9		9.5		8				34.5	
VACATION 10.999 154				***		***		***		***		***		****		
HOLIDAY 10.999 155			8	***		***		***		***		***		****	8	
SICK 10.999 152				***		***		***		***		***		****		
TOTAL			8		8		9		9.5		8				42.5	

Remarks _____

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Staff Signature: Michael Wadden Manager Approval _____

EMPLOYEE MICHAEL WADDEN Week Ending 30 JULY 1989

Employee Number _____

Project	Phase	Labor Code	M		T		W		Th		F		S		Total Hours	
***	***	***	R	O/T	R	O/T	R	O/T	R	O/T	R	O/T	R	O/T	REG	O/T
20.362		200	5.0		3.0		4.0		0.5						12.5	
20.379		200					2.0		2.0		0.5				4.5	
20.304		200							4.0		7.5				11.5	
10.999		153	3.0				2.0		0.5						5.5	
20.388		200							1.5						1.5	
VACATION	10.999	154		***		***		***		***		***		****		
HOLIDAY	10.999	155		***		***		***		***		***		****		
SICK	10.999	152		***	.50	***		***		***		***		****	5	
TOTAL			8		8		8		8.5		8				40	

Remarks _____

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Staff Signature: Michael Wadden Manager Approval _____

EMPLOYEE Ann Hayward Week Ending June 18 1989

Employee Number EAH

Project	Phase	Labor Code	M		T		W		Th		F		S		Total Hours	
***	***	***	R	O/T	R	O/T	R	O/T	R	O/T	R	O/T	R	O/T	REG	O/T
10.999		151			3.5		4		5						12.5	
81.343		825			2.5		1		1						4.5	
10.700		151			1.5		2		2						5.5	
82.344		825			2		1		1						4	
20304		825					1.5		1						2.5	
VACATION 10.999 154				***		***		***		***		***		****		
HOLIDAY 10.999 155				***		***		***		***		***		****		
SICK 10.999 152			8	***		***		***		***		***		****	8	
TOTAL			8		9.5		9.5		10						37	

Remarks _____

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Staff Signature: Ann Hayward Manager Approval _____

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EMPLOYEE Ann Harward Week Ending July 9 1989

Employee Number _____

Project	Phase	Labor Code	M		T		W		Th		F		S		Total Hours	
***	***	***	R	O/T	R	O/T	R	O/T	R	O/T	R	O/T	R	O/T	REG	O/T
10.999		153			5		5		6						16	
81.343		800			2				1						3	
82.344		800			1		1		2						4	
20.388		200			1		1								2	
88.312	3	800			1		1								2	
20.304		200					2		1						3	
20-362		200			.5										0.5	
VACATION 10.999 154				***		***		***		***		***		****		
HOLIDAY 10.999 155			8	***		***		***		***		***		****	8	
SICK 10.999 152				***		***		***		***		***		****		
TOTAL			8		10.5		10		10						38.5	

Remarks _____

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Staff Signature: _____ Manager Approval _____

EMPLOYEE Ann Harwards Week Ending July 23 1989

Employee Number 02

Project	Phase	Labor Code	M		T		W		Th		F		S		Total Hours	
***	***	***	R	O/T	R	O/T	R	O/T	R	O/T	R	O/T	R	O/T	REG	O/T
20.341	1	200	1.5		2.5										4	
20.304		200	1		1										2	
10.999		~~153~~	7		6.5		6		4		4				27.5	
20.387		~~153~~					1		2		5		8		16	
88.312	3	~~200~~					3								3	
81.343		200							2						2	
82.344		200							2						2	
VACATION 10.999 154				***		***		***		***		***		****		
HOLIDAY 10.999 155				***		***		***		***		***		****		
SICK 10.999 152				***		***		***		***		***		****		
TOTAL			9.5		10		10		10		9		8		56.5	

Remarks _____

Staff Signature: _____ Manager Approval _____

EMPLOYEE Ann Harward

Employee Number _____

Week Ending July 30 1989

Project	Phase	Labor Code	M		T		W		Th		F		S		Total Hours	
***	***	***	R	O/T	R	O/T	R	O/T	R	O/T	R	O/T	R	O/T	REG	O/T
10.999		153	5		4		5		3						17	
20.304		200	2		1										3	
88312		800	1						1						2	
20.375		200			1										1	
81.343		800			2		1		2						5	
82.344		800					2		1						3	
87.346		800							1						1	
VACATION 10.999 154				***		***		***		***		***		****		
HOLIDAY 10.999 155				***		***		***		***		***		****		
SICK 10.999 152				***		***		***		***		***		****		
TOTAL			8		8		8		8						32	

Remarks _____

Staff Signature: _____ Manager Approval _____

EMPLOYEE Julie Ev Week Ending May 28 1989

Employee Number _____

Project	Phase	Labor Code	M		T		W		Th		F		S		Total Hours	
***	***	***	R	O/T	R	O/T	R	O/T	R	O/T	R	O/T	R	O/T	REG	O/T
10.999		153			3.5		5		6		7				21.5	
20.304		222			2		1		0.5		1				4.5	
20.345		222			1										1	
81.343		822			1		1		1						3	
82.344		823			1		1		1						3	
20.345		223					0.5								0.5	
86.328		822									0.5				0.5	
VACATION 10.999 154				***		***		***		***		***		****		
HOLIDAY 10.999 155			8	***		***		***		***		***		****		
SICK 10.999 152				***		***		***		***		***		****		
TOTAL			8		8.5		8.5		8.5		8.5				42	

Remarks _____

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Staff Signature: Julie Manager Approval _____

Victoria Day

EMPLOYEE Julie Ev Week Ending MAY 31 1989

Employee Number _____

Project	Phase	Labor Code	M		T		W		Th		F		S		Total Hours	
***	***	***	R	O/T	R	O/T	R	O/T	R	O/T	R	O/T	R	O/T	REG	O/T
10.999		153	3		3		3.5								9.5	
20.304		222	2		2										4	
81.343		822	2				1								3	
82.344		822	2		4		1								7	
20.379		222					3								3	
VACATION 10.999 154				*** *** *** *** ***		*** *** *** *** ***		*** *** *** *** ***		*** *** *** *** ***		*** *** *** *** ***		**** **** **** **** ****		
HOLIDAY 10.999 155																
SICK 10.999 152																
TOTAL				9		9		8.5							26.5	

Remarks _____

Staff Signature: Julie Manager Approval _____

EMPLOYEE Julie E. Week Ending May 21 1989

Employee Number _____

Project	Phase	Labor Code	M		T		W		Th		F		S		Total Hours	
***	***	***	R	O/T	R	O/T	R	O/T	R	O/T	R	O/T	R	O/T	REG	O/T
10.999		163	3.5		2.5		1				0.5				7.5	
10.999		163	-				1								1	
86 328		822	2		0.5		5								7.5	
86 328		823	1		6.5				6						13.5	
20.304		222	1		1		1		1		1				5	
82.344		823	1		1		1		1		1				5	
20.369		222							1.5						1.5	
20.341	1	222									0.5				0.5	
20.377		223									5				5	
VACATION 10.999 154				***		***		***		***		***		****		
HOLIDAY 10.999 155				***		***		***		***		***		****		
SICK 10.999 152				***		***		***		***		***		****		
TOTAL			8.5		11.5		9		9.5		8				46.5	

Remarks _____

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Staff Signature: Julie Manager Approval _____

EMPLOYEE Julie E. Week Ending August 31 1989

Employee Number _____

Project	Phase	Labor Code	M		T		W		Th		F		S		Total Hours	
***	***	***	R	O/T	R	O/T	R	O/T	R	O/T	R	O/T	R	O/T	REG	O/T
10.999		153	4		5		4		4						17	
88.312	3	800	1		2		2								5	
20.362		200	1		2		2		1.5						6.5	
87.346		800					1		1						2	
2a 304		200	2						2						4	
VACATION 10.999 154				*** *** *** *** ***		*** *** *** *** ***		*** *** *** *** ***		*** *** *** *** ***		*** *** *** *** ***		**** **** **** **** ****		
HOLIDAY 10.999 155																
SICK 10.999 152																
TOTAL			8		9		9		8.5						34.5	

Remarks _____

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Staff Signature: Julie Manager Approval _____

EMPLOYEE Julie Er Week Ending Aug 27 1989

Employee Number _____

Project	Phase	Labor Code	M		T		W		Th		F		S		Total Hours	
***	***	***	R	O/T	R	O/T	R	O/T	R	O/T	R	O/T	R	O/T	REG	O/T
10.999		153	8.5		7		5		5		6				31.5	
20.362		200			1				2						3	
88 312		800			1		1		2		1				5	
20.304		200					3				1				4	
VACATION 10.999 154				*** *** *** *** ***		*** *** *** *** ***		*** *** *** *** ***		*** *** *** *** ***		*** *** *** *** ***		**** **** **** **** ****		
HOLIDAY 10.999 155																
SICK 10.999 152																
TOTAL			8.5		9		9		9		8				43.5	

Remarks _____

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Staff Signature: Julie Manager Approval _____

EMPLOYEE Julie E Week Ending August 20 1989

Employee Number _____

Project	Phase	Labor Code	M		T		W		Th		F		S		Total Hours	
***	***	***	R	O/T	R	O/T	R	O/T	R	O/T	R	O/T	R	O/T	REG	O/T
88312	3	800	1												1	
20.362		200	1												1	
10.999		153	7		4.5		4.5		8						24	
20.304		200			4		4								8	
VACATION 10.999 154				*** ***		*** ***		*** ***		*** ***		*** ***		**** ****		
HOLIDAY 10.999 155				*** ***		*** ***		*** ***		*** ***		*** ***		**** ****		
SICK 10.999 152				***		***		***		***		***		****		
TOTAL			9		8.5		8.5		8		4				34	

Remarks _____

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Staff Signature: Julie Manager Approval _____

* FRIDAY OFF